

Metabolic Profiling of Total Physical Activity and Sedentary Behavior



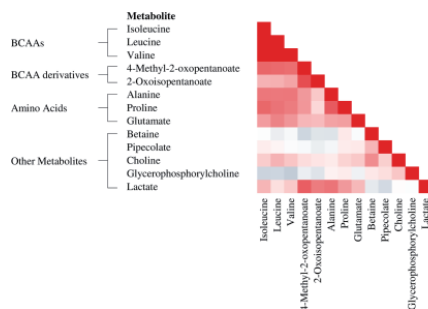
STUDY QUESTION

How are plasma metabolomic profiles, especially for amino acids, affected by total physical activity (TPA) and sedentary behavior?

TPA is associated with health benefits, but the underlying mechanisms are poorly understood.

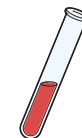


CE-MS metabolomics is promising approach to find biomarkers of TPA.



808 + 385
men men (replication)
from TMCS Wave1.

115 plasma metabolites
were profiled using CE-MS.



BCAAs and derivatives

Isoleucine
Leucine
Valine
4-Methyl-2-oxopentanoate
2-Oxoisopentanoate

Other AAs

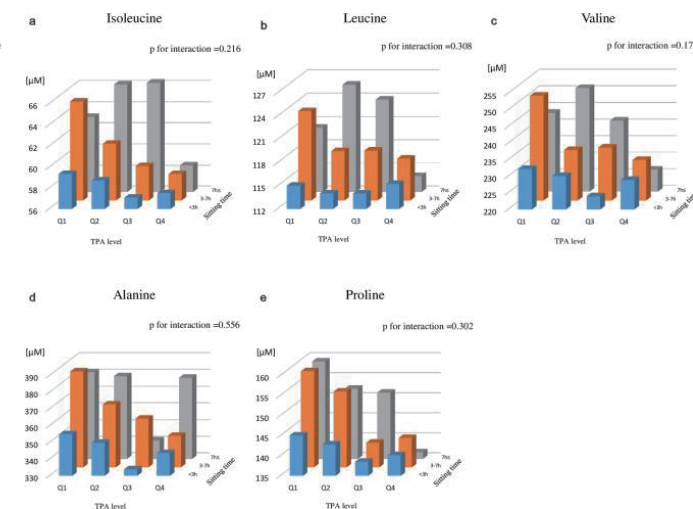
Alanine
Proline
Glutamate

Other metabolites

Betaine
Pipecolate
Choline
Glycerophosphorylcholine
Lactate

Original population (n=808)

	Crude p	Fully adjusted p [#]
Isoleucine	2.5E-08	1.4E-05
Leucine	0.004	0.035
Valine	8.0E-07	2.1E-04
4-Methyl-2-oxopentanoate	1.3E-03	0.012
2-Oxoisopentanoate	0.004	0.020
Alanine	8.3E-05	9.5E-04
Proline	1.7E-05	9.8E-04
Glutamate	0.002	0.008
Betaine	3.7E-06	6.0E-05
Pipecolate	1.6E-04	0.002
Choline	7.6E-04	1.4E-03
Glycerophosphorylcholine	0.005	0.015
Lactate	1.2E-04	1.2E-03



BCAAs, their derivatives, Ala, and Pro associations with TPA were confirmed.

BCAAs, Ala, and Pro decreased while both daily TPA increased and daily sitting time decreased.



BCAAs and their derivatives, as well as Ala and Pro might play a key role in the protective effects of higher TPA and/or less sedentary behavior on non-communicable diseases.